RUSSIAN SCIENTIFIC PUBLICATIONS.

IN the Journal of the Imperial Russian Geographical Society, vol. xlii., parts ii. and iii., Mr. V. U. Grigorieff writes on the agricultural position of the natives of the Minusin country, Yenisei government. The author carefully examines the economic and legal relations of Russian colonists and aborigines, and considers that agricultural prospects are good, but would be improved by the introduction of scientific methods. The Tartar natives of Minusin have changed but little during centuries of intercourse with Russians, and this persistence of racial characteristics and habits contradicts the opinion of some investigators that the natives will disappear unless Russified. It is interesting to note that cattle-rearing is carried on best on the borders of steppe and forest land, and is not so satisfactory if conducted exclusively in the steppe or the forest.

Mr. A. V. Koltshak describes the last expedition in search of Baron Toll to Bennett Island, which was fitted out by the Academy of Sciences. The Baron left the vessel *Dawn* in May, 1902, with the intention of exploring the island. The search expedition came across some notes by the Baron, indicating the date of his departure for the south. Thorough search failed to reveal fresh traces, and there appears to be no doubt that the names of Baron Toll and his party have to be added to the long roll of explorers who, since Sir John Franklin, have perished in Arctic regions in the cause of science. Mr. K. N. Tultshinsky writes on a commercial journey to Bering Straits, during which he witnessed mining operations in Alaska. Statistics of means of communication in Russia are contributed by Mr. I. F. Borkovsky.

The various Tartar tribes along the Volga and the conditions of their education have been studied by Mme. S. V. Tshitsherin, who worked among them during the famine of 1899. She describes the "Ilminsky" system of education, the work of an enlightened, patriotic Russian and Slavophil, N. I. Ilminsky, who spent many years among the heathen tribes, winning their love and esteem by sympathy and knowledge of their languages and conditions, and will be remembered for his philanthropic efforts to introduce Russian civilisation. Statistics of population and interesting illustrations accompany this article.

An important contribution, by Mr. A. I. Voieikoff, bears the comprehensive title of "Distribution of Populations of the Earth in Dependence upon Natural Conditions and the Activity of Man," with numerous statistics and charts. It is tempting to dwell on Mr. Voieikoff's facts and figures at great length. In Siberia, Turkestan, and the Caucasus there are opportunities and land enough to sustain millions if the necessary knowledge and capital were applied. Of countries of which details of population are published, New Zealand possesses the smallest mortality, and this may be accounted for by its agricultural people living in plenty, the small number of children, and the fact that the mothers do not labour in the field; but New Zealand is still in its immigration stage, and there are few old men as compared with Ontario and Australia, where the process of colonisation began earlier. Paucity of births in Australia is a serious question. Such hindrances to population as plagues, artificial feeding of infants, and alcoholism are discussed, and two conclusions arrived at are worth noting:—(1) degeneration undoubtedly exists among the more cultured classes of the Russian nation and in the manufacturing population; (2) alcoholism is less prevalent among the Russian people than among other nations of Europe and their colonies. Alcoholism, *i.e.* chronic poisoning by alcohol through daily—though moderate—use of *vodka* or beer, must be distinguished from drunkenness. Scarcely a question is left untouched, and the author's studies range over ancient and modern history, medical and registrars' reports, and the trade statistics of many countries.

Vol. xxxvi., part ii., of the Proceedings of the Imperial Society of Naturalists of St. Petersburg contains a vast amount of important and interesting material. Prof. N. E. Wedensky contributes an obituary notice, with a portrait and account of the work, of Prof. I. M. Setchenoff, an eminent physiologist, pupil of Du Bois Reymond, Funke, Ludwig, and Helmholtz, founder and teacher in the Russian physiological school, and a leading authority on the brain and nerves. With the death of this man of science Russia lost a distinguished son. A list of his writings on medical and chemical subjects follows. An exhaustive study of fresh-water Rhizopoda is given by Mr. S. Averintseff, who begins with the physical properties of protoplasm and passes to the structure of shells. A bibliography, lists of species, and handsome plates are given. The first section is taken up with the general morphology and physiology of Rhizopoda, the second is devoted to *R. testacea*, and a further part on *R. nuda* is promised.

The rest of the volume is occupied with papers on the study of nerves. Mr. W. K. Denemark examines and describes the excitability and conductibility of nerves exposed to the action of distilled water. This influence, due to the extraction of salts, produces in nerves the successive functional alterations observed under the influence of positive agents—narcotics, salt solutions, high temperature, &c. Restitution is only effected by the application of sodium salts. The author considers that the presence of sodium salts in the chemical structure of a nerve is absolutely essential for its functions. The effects of a constant current on a nerve which has been subjected to the action of narcotics are described by Mr. N. N. Malisheff. Mr. G. Levitsheff details the action of halogen acids on nerves, and Mme. H. N. Gulinoff the influence of freezing. Prof. N. E. Wedensky contributes a lengthy paper on the effects of strychnine intoxication on the reflex system.

In No. 17 of the Proceedings of the Zoological and Zootomical Cabinets of St. Petersburg University, Mr. V. Zhuk writes on the lamprey, describing external marks, the organs, skin, skeleton, and muscles, with illustrations. An extensive bibliography of Cyclostomi follows. Studies in the anatomy of Piscicola are furnished by Mr. V. D. Zelensky, with a German *résumé*. *P. geometra* is the only species found in European fresh waters. Mr. Zelensky treats (1) metamerism with reference to the nervous system, and (2) the vessel system. A short bibliography follows. Mr. V. M. Shimkevitsh, one of the editors, writes on the correlations of Bilateria and Radiata. In conclusion, he remarks that, speaking generally, the principle of gradual displacement of one source of origin by a neighbouring one, sometimes even developed from another embryonic layer, has had far greater application in embryology than is usually considered. This principle enables a comparison between organs not at all homologous in origin to be established.

In the Proceedings of the Imperial Society of Naturalists, vol. xxxiv., part v., Mr. K. D. Glinka records extensive observations with regard to weathering. Observations of this nature, he points out, should not be confined to the surface of soils, but should embrace lower strata. An alumino-silicate dissolved in water may, in favourable circumstances, give rise to a series of new combinations, *e.g.* zeolites. Analysis of a fresh piece of rock shows that out of 1 per cent. of alumina, 0·72 per cent. is lost in solution. This high solution indicates that a considerable portion of alumina in sandstone does not exist in the form of primary silicates, but in a free form. The author discusses the genesis of the mineral serizite, first discovered in the Taunus range, and taken for talc, to which it bears external resemblance. Numerous tables of analyses are furnished. Taking widely separate districts in Russia, Mr. Glinka describes weathering of biotites, augites, zeolites, &c., at considerable length. There is a short report by Prof. P. A. Zemiatchensky on the rate of weathering of sand and limestone formations, with hints as to calculation of their antiquity. Mr. V. Lehmann sends a contribution, with a plate, on Terebratulacea in layers with *Virgatites virgatus* and *Oxynoticeras catenulatus*. The attention of palæontologists has been directed chiefly to the study of ammonites, and it is important to examine other forms. The author corrects the hitherto accepted list.

The Bulletin of the Imperial Academy of Sciences is worthy of comparison with the highest publications of this nature. We have received three handsome volumes, containing the proceedings of the physico-mathematical section. In vol. xxii., Mr. T. Wyragevitch writes on the Actinia of the Black Sea in the neighbourhood of Balaclava, and Mr. A. Borissiak contributes notes on

Black Sea plankton. Astronomers will be interested in the calculations of Mr. G. A. Tikhoff with regard to the position of stars. Of wide general interest is the article by Mr. K. N. Davidoff on the islands of the Indo-Australian archipelago. The fusion of Europeans and Malays in Amboina has produced a curious type, and the Malay tongue is mingled with Dutch and Portuguese words. According to a horrid custom, a would-be bridegroom cannot be accepted until he makes the maiden an offering of the head of an enemy. Mr. A. Birula writes on the Solifugæ of Persia, with frequent references to Mr. R. Pocock's notes on this order. In vol. xxiii., the eminent naturalist Mr. V. Bianchi describes Passeriformes and Palæarctic larks (Alaudidæ), basing his observations on collections in the museums of London, Tring, and Paris. He expresses indebtedness to Dr. Bowdler Sharpe, the Hon. W. Rothschild, and other naturalists for help.

Mr. N. Donitch contributes reports of observations of the annular solar eclipse of March, 1904, made at Cambodia, and of the total solar eclipse of August, 1905. In the latter case, observations were made at Alcala and Assouan, and Mr. Donitch acknowledges indebtedness for assistance from members of the British Survey Department in Egypt. Notes of inundations at St. Petersburg are furnished by Mr. S. Griboyedoff, and lengthy studies of rainfall in the capital, with diagrams and tables, are given by Mr. E. Rosenthal. Mr. A. Belopolsky's investigations of the radial velocity of the variable star Algol appear in vol. xxiv., and there is another astronomical paper by Mme. Zhilov, on the proximate absolute orbit of the minor planet Doris. Mr. V. Bianchi describes a new species of pheasant from the mountain regions of western China. Balloon experiments at Kutshino are described by Mr. V. Kuznetsoff. From fossils collected by the polar expedition of Baron Toll, 1900–3, Mme. M. Pavloff is able to draw deductions as to the changes of climate of east Siberia from the Tertiary period. Several papers on aërial mechanics are by Mr. D. P. Riabushinsky, and Mr. M. Golenkin writes on a botanical visit to Java. The report of the geological museum of Peter the Great (Academy of Sciences) concludes the volume.

THE CORALS OF HAWAII.[1]

THE madreporarian corals present some of the most difficult problems in the matter of the determination of species that are to be found in the whole range of the animal kingdom. So difficult are these problems that Mr. Bernard in his indefatigable labour on the catalogue of the Madreporaria of the British Museum frankly gave them up, and, abandoning the time-honoured binomial system, adopted a new numerico-geographical system of nomenclature.

The difficulty arises from our want of knowledge of the influence played by environmental conditions in the formation of the characters that are presented by a colony of coral polyps and the skeletal structures to which they give rise. In the absence of any direct experimental evidence, upon which alone the problems can be solved, it has been the custom to give specific names to groups of specimens which seem to be separated from other and similar groups of specimens by appreciable differences in the sum total of their characters. The species that are thus constituted inevitably break down if new specimens are found that are intermediate in character between the specific groups already determined, but when they are based on the examination of a very large number of specimens collected from a restricted area, they have at least the advantage of serving a useful purpose for the systematist for a considerable period of time.

It is this system which Mr. Vaughan has adopted in the very handsome memoir of 415 pages, and illustrated by ninety-six plates, which appears under the modest title of "Bulletin 59 of the Publications of the United States National Museum." The author has given himself the task of examining a very large number of specimens from the Hawaiian Islands and the island of Laysan, of forming a conclusion as to the most convenient limits for the specific groups, and of giving an opinion on the species problem based on his extensive knowledge and experience of these corals. The result is a work which cannot fail to be of essential importance to all those who are interested in the Madreporaria, and a most noteworthy addition to human knowledge.

But in spite of its undoubted value, and in spite of the great skill and labour that have been spent in its compilation, there are some points in this memoir on which it is necessary to offer a few words of criticism, not in any unfriendly spirit, but in the hope that they may influence in some way those who follow in the author's footsteps and attempt to write a memoir of a similar kind.

Our knowledge of the anatomy of the coral polyps themselves, as distinct from the skeletal structures they form, is admittedly imperfect, but the researches of Moseley, Bourne, Fowler, Duerden and others have at least thrown some light on the relations of the genera and on those characters of the species that are comparatively free from environmental variation. Such evidence as these researches afford must be taken into consideration in any satisfactory scheme of classification, and must be used, so far as it is possible to use it, in conjunction with the evidence derived from the structure of the skeletal characters.

In the light of this evidence, for example, the division of the order into the old suborders Imperforata and Perforata breaks down. The perforate Eupsammiidæ are not related to the Madreporidæ and Poritidæ so closely as to justify their inclusion in the same suborder, whereas the imperforate Pocilloporidæ are not related to the Oculinidæ and Stylophoridæ with which they were formerly associated, but exhibit much closer affinities with some of the Imperforata. It may be true, as Mr. Vaughan remarks, that there is at present no satisfactory classification of the Madreporaria. It may be that for many years to come no classification will be suggested that will be satisfactory to all students of the group. But there is no reason whatever for ignoring the valuable researches of Duerden, and for retaining a classification that is altogether antiquated and misleading, such as the one that is used in this memoir.

It is clear that until we have obtained far more information than we have at present concerning the structure of the soft parts of the coral anatomy, the skeletal characters must play the most important part in the determination of species, but in such a determination every character that the hard parts exhibit must receive its due recognition. For example, it is well known that some genera, and perhaps some species, are more liable than others to be influenced by the presence of epizoic crustacea, worms, and other animals, and no description of a series of specimens is satisfactory if this influence is altogether ignored. The genus Pocillopora is one of those that is particularly liable to the attacks of the crab Hapalocarcinus, and in a note by Prof. Verrill that is quoted by the author (p. 88), the statement is made that the species of this genus in the Hawaiian Islands are usually subject to the malformations caused by this epizoite. But in the descriptions of the species of this genus the author makes no reference to the crab galls, nor are they clearly shown in any of the photographs that are given to illustrate the text. This is a serious oversight, for when the memoir is used for the purpose of the identification of the species of Pocillopora, the galls will at once present a difficulty which the museum curator will not be able to solve by its help. He will ask how far he is able to neglect the presence of these galls, or in what respect they are the determining cause of the general form of growth upon which the species and varieties are founded.

An interesting form described in the volume is *Leptoseris tubulifera*, which differs from the other species of the genus in showing a number of hollow, tubular cavities around which the corallum is folded. Similar tubes are found in the alcyonarian genus Solenocaulon, in the stylasterine genus Errina, and in the madreporarian genera Neohelia, Amphihelia, &c., and in all these cases there seems to be little doubt that they are due to the influence on growth of epizoic crustacea or worms. It is difficult to believe that this is not also the case in *Leptoseris tubulifera*, and if it is the specific distinction from *L. hawaiiensis* is not very clear.

[1] "Recent Madreporaria of the Hawaiian Islands and Laysan." By T. Wayland Vaughan. Pp. ix+427; illustrated. (Washington: Government Printing Office, 1907.)